

CASE REPORT

Point-of-care ultrasound (POCUS) for diagnosing cesarean scar ectopic pregnancy in the emergency department

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ABSTRACT

Background: Cesarean scar ectopic pregnancy (CSEP) is a rare but potentially life-threatening type of ectopic pregnancy in which implantation occurs within the myometrial defect of a prior cesarean scar. Early recognition is critical because of the risk of severe hemorrhage, uterine rupture, loss of fertility, and maternal death. We report a case in which a CSEP was diagnosed by a point-of-care ultrasound (POCUS), which highlighted key sonographic findings.

Case Presentation: A 37-year-old female presented with lower abdominal pain and amenorrhea. The investigations were positive for pregnancy. POCUS revealed a viable ectopic pregnancy embedded within the myometrium at the cesarean scar, with endogenous growth toward the uterine cavity. These findings were consistent with those of the CSEP, which prompted an emergent obstetric consultation for definitive treatment.

Conclusion: This case highlights the potential of POCUS in the emergency setting to expedite CSEP diagnosis and prompt early obstetric consultation, where early recognition may improve clinical outcomes. Therefore, it is important for emergency physicians to recognize the sonographic features of CSEP.

Keywords: Cesarean scar, ectopic pregnancy, point-of-care ultrasound, case report.

Introduction

Cesarean scar ectopic pregnancy (CSEP) is very rare, but an increasingly recognized form of ectopic pregnancy in which the embryo is implanted within the myometrial defect of a previous cesarean incision [1]. Rising cesarean delivery rates worldwide have contributed to its growing prevalence [1–2]. Because delayed diagnosis can lead to uterine rupture and critical hemorrhage, maintaining early clinical suspicion is essential, particularly among women with prior cesarean sections [1]. We report a case in which a CSEP was diagnosed by point-of-care ultrasound (POCUS), highlighting key sonographic findings and the importance of early identification in patients with a history of cesarean delivery presenting during early pregnancy.

Case Presentation

A 37-year-old woman (gravida 5, para 4) presented to the emergency department with lower abdominal pain, moderate in severity, and without vaginal bleeding or a history of trauma. She had four prior cesarean deliveries. The patient's calculated gestational age was 8 weeks

based on the last menstrual period. The pregnancy was conceived naturally. Upon examination, her vital signs were within the normal range, and her abdomen was soft with mild lower abdominal tenderness. The pregnancy test was positive, with a quantitative beta-hCG concentration of 58,534 mIU/mL. A transabdominal and transvaginal POCUS was performed. POCUS revealed a viable ectopic pregnancy embedded within the myometrium at the cesarean scar, with endogenous growth toward the uterine cavity (Figures 1–3). These findings were consistent with those of a CSEP. The patient was admitted to the hospital under the obstetrics and gynecology team for definitive management.

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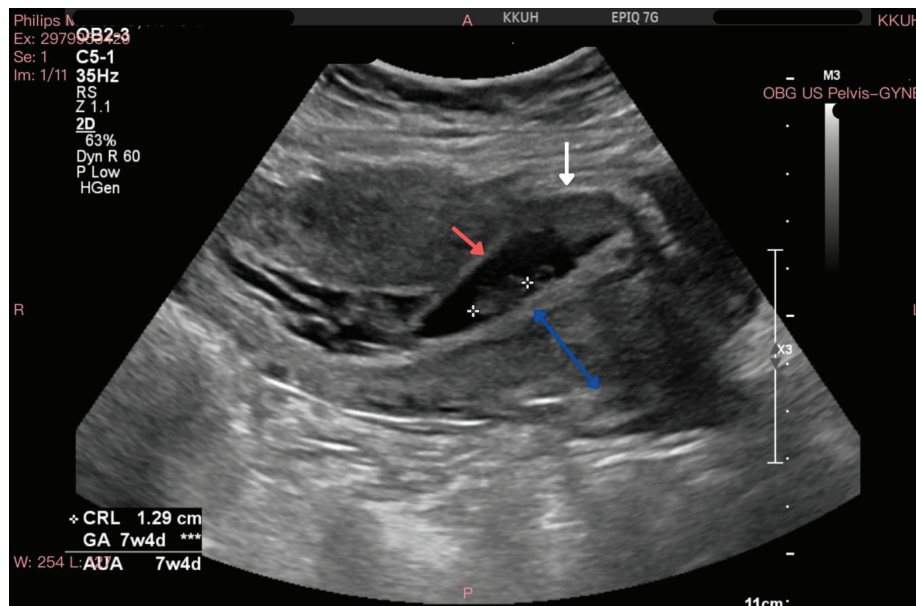


Figure 1. Transabdominal POCUS demonstrated a sagittal view of the uterus with a gestational sac located in the anterior part of the uterus. The white arrow indicates thinning of the anterior aspect of the myocardium at the area of the cesarean scar, the red arrow indicates a gestational sac implanted into the anterior myometrium with progressive growth of the sac toward the uterine cavity, and the blue arrow indicates normal thickness of the posterior myometrial wall. Gestational sac diameter and crown-rump length yield an estimated gestational age of 7 weeks + 4 days.

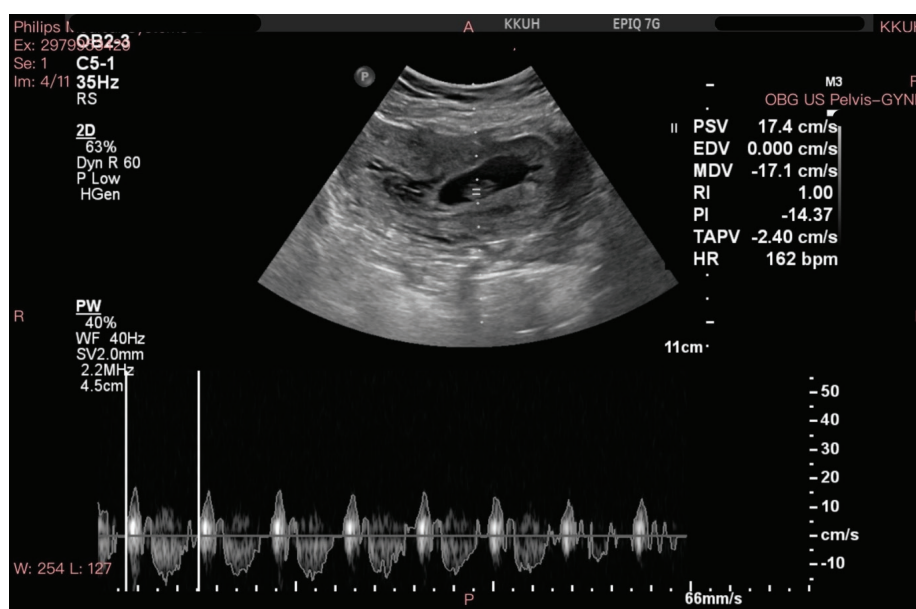


Figure 2. Transabdominal POCUS demonstrated a sagittal view of the uterus with a gestational sac and a viable embryo with a fetal heart rate of 162 bpm.

Discussion

CSEP is broadly classified into two subtypes: endogenic and exogenic [1]. The endogenic form, also described as “on the scar,” develops toward the uterine cavity, whereas the exogenic form (“in the niche”) results from deep implantation within the cesarean scar defect, with potential extension toward the bladder or abdominal cavity [1].

Transvaginal ultrasound remains the primary imaging modality [1–3]. The diagnostic criteria for CSEP, as described by the Royal College of Obstetricians and Gynecologists, include an empty uterine cavity, a gestational sac embedded anteriorly at the level of the internal os embedded at the site of the previous lower uterine segment of the cesarean section scar, a thin (1–3 mm) or absent myometrium between the gestational sac and the bladder, a prominent trophoblastic/placental



Figure 3. Transvaginal POCUS demonstrated thinning of the anterior myometrium between the gestational sac and uterine serosa, with a myometrial layer thickness of 1.8 mm anterior to the gestational sac.

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83 circulation on Doppler, and an empty endocervical
84 canal [4]. The patient met all these criteria. However,
85 these diagnostic criteria have not undergone formal
86 validation and are primarily based on findings reported
87 in descriptive case series [4]. Several features of CSEP
88 are shown in Figures 1–3.

89 It is critical to differentiate CSEP pregnancies from
90 low intrauterine pregnancies (IUP) and cervical ectopic
91 pregnancies. In CSEP, the gestational sac is positioned
92 proximally to the midpoint axis of the uterus with a
93 deficient anterior myometrium, whereas in a low IUP, the
94 sac is located distally to the midpoint axis surrounded by
95 a preserved myometrial mantle [3]. Additionally, CSEP
96 can be distinguished from a cervical ectopic pregnancy
97 by its location relative to the internal cervical os [2].
98 CSEP is implanted in the lower uterine segment above
99 the level of the internal os, whereas in cases of cervical
100 ectopic pregnancy, it is embedded within the cervical
101 stroma below the level of the internal os [2]. Moreover,
102 the “sliding sign”—where transducer pressure causes
103 the gestational sac to move against the endocervical
104 canal—can help exclude an evolving pregnancy loss or
105 miscarriage, as the gestational sac remains fixed and does
106 not slide in an implanted cervical or CSEP [4].

107 Conclusion

108 In this case, POCUS was useful for early recognition and
109 expedited specialized care. Awareness of the imaging
110 features of cesarean scar ectopic pregnancy is important
111 for emergency physicians [5]. While POCUS holds
112 promise for earlier diagnosis, ongoing education and
113 training are essential for improving diagnostic accuracy
114 and patient outcomes.

115 List of Abbreviations

116 CSEP Cesarean scar ectopic pregnancy

ED Emergency department 117
IUP Intrauterine pregnancy 118
POCUS Point-of-care ultrasound 119

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Conflict of interest

The authors declare that they have no conflicts of interest. 123

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Ethical approval

Ethical approval is not needed at our institution for the
publication of an anonymous case report. 137

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